

AMENDMENTS TO THE CLAIMS

Claim 1 (Currently Amended): A pulverulent formaldehyde-free binder composition, ~~especially for fibrous and/or granular substrates, containing~~ comprising

- a) 40% by weight to 60% by weight, based on the binder composition, of a  
pulverulent copolymer polymerized from maleic anhydride and at least one  $\alpha$ -olefin as  
component A; and also
- b) 40% by weight to 60% by weight, based on the binder composition, of at least  
one pulverulent crosslinker which has two or more reactive groups capable of reacting with  
the carbonyl groups of maleic anhydride, as component B; and also
- c) optionally further additive materials.

Claim 2 (Original): A binder composition as claimed in claim 1, wherein the maleic anhydride fraction in the copolymer is up to 50% by weight, based on the copolymer.

Claim 3 (Canceled).

Claim 4 (Currently Amended): A binder composition as claimed in claim 1, wherein the  $\alpha$ -olefin is a C<sub>4</sub>-to C<sub>32</sub>- $\alpha$ -olefin ~~C<sub>32</sub>- $\alpha$ -olefins, preferably C<sub>4</sub>-to C<sub>6</sub>- $\alpha$ -olefins, more preferably C<sub>4</sub>-to C<sub>8</sub>- $\alpha$ -olefins and most preferably isobutene and diisobutene.~~

Claim 5 (Currently Amended): A binder composition as claimed in claim 1, wherein the crosslinker is selected from the group consisting of polyfunctional alcohols, polyfunctional amines, molecules which contain hydroxyl ~~and/or~~ or amino groups, molecules which contain hydroxyl and amino groups, thiols, hydroxyl-terminated polymers, epoxides,

isocyanates, organohalogen compounds, aziridines, carbodiimides, oxazolines, aminosilanes and hydroxylalkylamines.

Claim 6 (Currently Amended): A binder composition as claimed in claim 1, wherein the difference between the softening point of the copolymer and the melting or softening point of the crosslinker is ~~generally less than 250°C, preferably less than 200°C and more preferably less than 180°C.~~

Claim 7 (Currently Amended): A binder composition as claimed in claim 1, wherein the binder composition has a storage modulus G' which initially decreases at least once to a value  $\leq 10^8$  Pa, ~~preferably  $\leq 10^7$  Pa and more preferably  $\leq 10^6$  Pa,~~ and then rises again, on heating from 50°C to 300°C, ~~preferably from 50°C to 250°C and more preferably 80°C to 250°C.~~

Claim 8 (Currently Amended): A pulverulent formaldehyde-free binder composition, ~~especially for fibrous and/or granular substrates, containing comprising~~

- a) a pulverulent copolymer formed from 25 mol% to 50 mol%, based on the copolymer, of maleic anhydride, ~~at least one  $\alpha$ -olefin and/or~~ and styrene or maleic anhydride and at least one  $\alpha$ -olefin and styrene as component A'; and
- b) at least one pulverulent crosslinker which has two or more reactive groups capable of reacting with the carbonyl groups of maleic anhydride, as component B; and also
- c) optionally further additive materials.

Claim 9 (Currently Amended): A binder composition as claimed in claim 8, wherein the copolymer fraction in the binder composition is in the range from 5% by weight to 95% by weight, ~~preferably in the range from 40% by weight to 90% by weight and especially in the range from 40% by weight to 60% by weight, each percentage being based on the binder composition, and/or wherein~~ the crosslinker fraction in the binder composition is in the range from 5 to 95% by weight, ~~especially in the range from 10 to 60% by weight and preferably in the range from 40 to 60% by weight, each percentage being based on the binder composition.~~

Claim 10 (Currently Amended): A binder composition as claimed in claim 8, wherein the  $\alpha$ -olefin is a C<sub>32</sub>- $\alpha$ -olefin ~~C<sub>32</sub>- $\alpha$ -olefins, preferably C<sub>4</sub>-to-C<sub>6</sub>- $\alpha$ -olefins, more preferably C<sub>4</sub>-to-C<sub>8</sub>- $\alpha$ -olefins and most preferably isobutene and diisobutene.~~

Claim 11 (Original): A binder composition as claimed in claim 8, wherein the crosslinker is selected from the group consisting of polyfunctional alcohols, polyfunctional amines, molecules which contain hydroxyl and/or amino groups, thiols, hydroxyl-terminated polymers, epoxides, isocyanates, organohalogen compounds, aziridines, carbodiimides, oxazolines, aminosilanes and hydroxylalkylamines.

Claim 12 (Currently Amended): A binder composition as claimed in claim 8, wherein the difference between the softening point of the copolymer and the melting or softening point of the crosslinker is generally less than 250°C, ~~preferably less than 200°C and more preferably less than 180°C.~~

Claim 13 (Currently Amended): A binder composition as claimed in claim 8, wherein the binder composition has a storage modulus  $G'$  which initially decreases at least once to a value  $\leq 10^8$  Pa, preferably  $\leq 10^7$  Pa and more preferably  $\leq 10^6$  Pa, and then rises again, on heating from 50°C to 300°C, ~~preferably from 50°C to 250°C and more preferably 80°C to 250°C.~~

Claim 14 (Currently Amended): A process for binding fibrous ~~and/or~~ granular substrates or fibrous and granular substrates, which comprises a pulverulent formaldehyde-free binder composition as claimed in claim 1 being mixed with fibrous ~~and/or~~ granular substrates or fibrous and granular substrates and binding the latter ~~preferably by heating in~~ the presence or absence of at least one catalyst.

Claim 15 (Currently Amended): A process as claimed in claim 14, wherein the fibrous ~~and/or~~ granular substrate or the fibrous and granular substrate is selected from the group consisting of rockwool fibers, mineral fibers, glass fibers, wood fibers, hemp fibers, sisal fibers, jute fibers, flax fibers, textile fibers, wool fibers, cotton fibers, cellulose fibers, ~~and synthetic fibers, especially polyester and nylon,~~ wood chips, cork granules, sand, ~~especially core sand for casting molds, and~~ aluminum oxides, ~~especially abrasive materials.~~

Claim 16 (Currently Amended): A process for binding fibrous ~~and/or~~ granular substrates or fibrous and granular substrates, which comprises a pulverulent formaldehyde-free binder composition as claimed in claim 8 being mixed with fibrous ~~and/or~~ granular substrates or fibrous and granular substrates and binding the latter ~~preferably by heating in~~ the presence or absence of at least one catalyst.

Claim 17 (Currently Amended): A process as claimed in claim 16, wherein the fibrous ~~and/or~~ granular substrate or the fibrous and granular substrate is selected from the group consisting of rockwool fibers, mineral fibers, glass fibers, wood fibers, hemp fibers, sisal fibers, jute fibers, flax fibers, textile fibers, wool fibers, cotton fibers, cellulose fibers and synthetic fibers, ~~especially polyester and nylon~~, wood chips, cork granules, sand, ~~especially core sand for casting molds~~, and aluminum oxides, ~~especially abrasive materials~~.

Claim 18 (Currently Amended): ~~Products, especially shaped articles, obtainable~~ A product obtained by the process of claim 14.

Claim 19 (Currently Amended): ~~Products, especially shaped articles, obtainable~~ A product obtained by the process of claim 16.

Claim 20 (New): A binder composition as claimed in claim 1, wherein the  $\alpha$ -olefin is a C<sub>4</sub>- to C<sub>8</sub>- $\alpha$ -olefin.

Claim 21 (New): A binder composition as claimed in claim 1, wherein the  $\alpha$ -olefin is a C<sub>4</sub>- to C<sub>6</sub>- $\alpha$ -olefin.

Claim 22 (New): A binder composition as claimed in claim 1, wherein the  $\alpha$ -olefin is isobutene or diisobutene.

Claim 23 (New): A binder composition as claimed in claim 1, wherein the crosslinker is selected from the group consisting of trimethylolpropane, 1,6-hexanediol, pentaerythriol, neopentylglycol, L-lysine, sorbitol, polyvinyl alcohol and bisdiethanolamide of adipic acid.

Claim 24 (New): A binder composition as claimed in claim 1, wherein the difference between the softening point of the copolymer and the melting or softening point of the crosslinker is less than 200°C.

Claim 25 (New): A binder composition as claimed in claim 1, wherein the difference between the softening point of the copolymer and the melting or softening point of the crosslinker is less than 180°C.

Claim 26 (New): A binder composition as claimed in claim 1, wherein the binder composition has storage modulus  $G'$  which initially decreases at least once to a value of  $\leq 10^7$  Pa, and then rises again, on heating from 50°C to 250°C.

Claim 27 (New): A binder composition as claimed in claim 1, wherein the binder composition has a storage modulus  $G'$  which initially decreases at least once to a value of  $\leq 10^5$  Pa, and then rises again on heating from 80°C to 250°C.

Claim 28 (New): A binder composition as claimed in claim 8, wherein the polymer fraction in the binder composition in the range from 40% by weight to 90% by weight, based

on the binder composition, and wherein the crosslinker fraction in the binder composition is in the range from 10 to 60% by weight, based on the binder composition.

Claim 29 (New): A binder composition as claimed in claim 8, wherein the polymer fraction in the binder composition in the range from 40% by weight to 60% by weight, based on the binder composition, and wherein the crosslinker fraction in the binder composition is in the range from 40 to 60% by weight, based on the binder composition.

Claim 30 (New): A binder composition as claimed in claim 8, wherein the  $\alpha$ -olefin is a C<sub>4</sub>- to C<sub>8</sub>- $\alpha$ -olefin.

Claim 31 (New): A binder composition as claimed in claim 8, wherein the  $\alpha$ -olefin is a C<sub>4</sub>- to C<sub>6</sub>- $\alpha$ -olefin.

Claim 32 (New): A binder composition as claimed in claim 8, wherein the  $\alpha$ -olefin is isobutene or diisobutene.

Claim 33 (New): A binder composition as claimed in claim 8, wherein the crosslinker is selected from the group consisting of trimethylolpropane, 1,6-hexanediol, pentaerythriol, neopentylglycol, L-lysine, sorbitol, polyvinyl alcohol and bisdiethanolamide of adipic acid.

Claim 34 (New): A binder composition as claimed in claim 8, wherein the difference between the softening point of the copolymer and the melting or softening point of the crosslinker is less than 200°C.

Claim 35 (New): A binder composition as claimed in claim 8, wherein the difference between the softening point of the copolymer and the melting or softening point of the crosslinker is less than 180°C.

Claim 36 (New): A binder composition as claimed in claim 8, wherein the binder composition has storage modulus  $G'$  which initially decreases at least once to a value of  $\leq 10^7$  Pa, and then rises again, on heating from 50°C to 250°C.

Claim 37 (New): A binder composition as claimed in claim 8, wherein the binder composition has a storage modulus  $G'$  which initially decreases at least once to a value of  $\leq 10^5$  Pa, and then rises again on heating from 80°C to 250°C.

Claim 38 (New): The product as claimed in claim 18, wherein said product is a shaped article.

Claim 39 (New): The product as claimed in claim 19, wherein said product is a shaped article.



SUPPORT FOR THE AMENDMENTS

Claim 3 has been canceled.

Claims 1, 4-10, and 12-19 have been amended.

Claims 20-39 have been added.

Claims 1 and 8 have been amended to remove the phrase “especially for fibrous and/or granular substrates,” so as not to be unduly restrictive. Claim 1 has also been amended to specify the amount of copolymer and crosslinker. The amendment of Claim 1 is supported by original Claims 1 and 3

Claims 4, 6, 7, 9, 10, 12, 13, 18 and 19 have been amended to remove the preferential language. New Claims 20- 22, 24-32, and 34-39 have been added to specifically claim the subject matter deleted from Claims 4, 6, 7, 9, 10, 12, 13, 18 and 19. Therefore, new Claims 20- 22, 24-32, and 34-39 are supported by original Claims 4, 6, 7, 9, 10, 12, 13, 18 and 19.

Claims 5, 8, and 14-17 have been further amended to clarify the “and/or” phrase. Support for this amendment is provided by the corresponding claims as originally filed.

Claims 7 and 13 have been further modified to specify that the storage modulus  $G'$  is that possessed by the binder composition. This amendment is supported by the corresponding claims as originally filed.

Claims 15 and 17 have also been amended to present a proper Markush group. Support for this amendment is provided by the corresponding claims as originally filed.

New Claims 23 and 33 have been added to further define the crosslinker in the binder composition. Claims 23 and 33 are supported by page 5, lines 17-19 and Example 3, page 11, line 19 of the originally filed specification.

No new matter has been added by the present amendments.